RESEARCH OPPORTUNITIES USING PLASMA MODIFICATION FOR TECHNICAL FABRICS

Minyazova A.N., Ilyushina S.V., Antonova M.V., Krasina I.V.
Kazan National Research Technological University, Russia, 420015, Kazan, K. Marksa, 68, strelfy@mail.ru

Abstract: The article discusses the possibility of using plasma modification to get anti adhesive properties of the technical fabrics.

Technical textiles are widely used for the production of conveyor belts, rubber hoses, flat and V-belts, upholstery seats and the interior lining of cars, for tents, shells, and folding camping hiking, automobile and aircraft tires; in as filter screens.

To reduce the adhesion of filling material on the basis of technical fabrics for the procurement of raw rubber is required to further processing with release formulations. Fabrics are either impregnated or duplicated with film material, or covered with various emulsions based on polymers of low molecular weight rubbers.

Non-equilibrium low-temperature plasma (NLP) changes the adhesive properties of the material surface depending on the parameters of the modification. In connection with this interest is the impact on the NLP fabrics for technical purposes, including on the basis of natural and synthetic fibers.

The object of the study performed technical fabrics ChLH (51% cotton, 49% of PEF) produced by "Krez," Elabuga. Insulating fabric cushioning ChLH is used in the tire industry between steel cord and rubber, therefore, is to make the necessary anti adhesive properties of the technical fabrics to the rubber. Treatment of the samples was carried out at high plasma installation of capacitive discharge. Evaluation of the surface properties of the object of research carried out by changing the capillary tissue according to a standard method according to GOST 3816 - 81.

Experimental dependence of the values of the capillary modes plasma treatment of tissue ChLH is presented in Table 1.

Table 1 - The influence of NLP processing on tissue capillarity (t = 3 min, P = 26.6 Pa; G = 0,04 g/s, argon / propane-butane (70%/30%))

Processing modes	I_a, A	0,2	0,3	0,3	0,5	0,5	0,5	0,7	0,7	0,8	Not treated
	U_a, kV	4,5	3	6	2,5	4,5	6,5	3	6	4,5	
Capillarity, mm		86	77	63	102	5	89	70	83	8	105

According to Table 1, the lowest elevation of tissue fluid after the plasma-forming gas treatment in argon / propane-butane (70% ÷ 30%) was observed for the parameters: Ia = 0,5 A, Ua = 4,5 kV, t = 3 min, P = 26,6 Pa.

Thus, the processing of technical textiles NLP allows you to effectively regulate the surface properties and can be recommended as an alternative to chemical modification.